

Critical Raw Materials Act

Necessity to add certain raw materials to Annex I and II

Brussels, 14 July 2023

I. Introduction

On 16 March 2023, the European Commission published its proposal for a Regulation establishing a framework for ensuring a secure and sustainable supply of critical raw materials (Critical Raw Materials Act). Critical raw materials are indispensable for a wide range of strategic sectors, including the semiconductor manufacturing industry. Therefore, ESIA welcomes the European Commission's proposal and the ambition to make the EU more resilient.

In addition to its previous comments (available [here](#)), **ESIA would like to stress the importance to add the following raw materials to Annex I and II of the Critical Raw Materials Act:**

- Iron (Fe)
- Phosphorus (P₄)
- Quartz (SiO₂)
- Silver (Ag)
- Tin (Sn)
- Zinc (Zn)

Moreover, ESIA recommends to specifically mention that silicon metal (Si) includes Silicon Carbide (SiC).

II. Use in the semiconductor manufacturing industry

Iron is used during the wafer fabrication in the production of raw silicon. It prevents the reaction of silicon and carbon to form silicon carbide.

Phosphorus is used for doping in semiconductor manufacturing. This refers to the intentional introduction of impurities into silicon to modulate its electrical properties.

Quartz in high purity is used as material for reaction chambers which protects the wafers from outside contamination and serves as a heat sink to even out the temperature in tube furnace operations.

Silver is used in many different ways in the semiconductor industry, including but not limited to deposition (layering on the wafer), silver wires used in semiconductor assembly, silver-based glues and pastes in soft solders. Silver alloy-based solders are essential in semiconductor manufacturing as an alternative to lead-containing solders.

Tin is used as an electric solder for connecting printed circuit boards.

Silicon carbide is used as an abrasive as well as a semiconductor. It is a base material for the manufacturing of many semiconductor products, in particular for fast, high-voltage and/or high-temperature devices.

Zinc is widely used in the production of varistors, ferrites, and solar cells in the semiconductor industry. It is also used as constituent of flame retardants in the encapsulations (mold compounds).

Iron, Phosphorous, and Zinc (as constituents) are further used as a basis for die mount and to carry electrical currents outside the package during the back-end manufacturing process.

III. The semiconductor supply chain

The materials that ESIA proposes to add to the lists of Critical and Strategic Raw Materials are **foundational building blocks of the semiconductor manufacturing process**. Small amounts of highest purity grades are used to produce wafers and equipment as well as during back-end manufacturing. Currently, there are no adequate substitutes available on the market meeting the quality requirements for semiconductors.

Moreover, the semiconductor industry is a truly global industry, with **supply chains that span the entire globe**. Until a product is delivered to the customer, a semiconductor device travels several times around the globe. Due to the length and complexity of the semiconductor supply chain and the quality requirements of inputs, it is **particularly sensitive to any type of disruption**.

As global demand for critical raw materials is rising, it is important to both diversify supply and build up domestic resources. Recent announcements by China to introduce new export control measures for Gallium and Germanium underscore the **necessity to ensure the EU's access to a secure and sustainable supply of these raw materials**.

In light of this, **ESIA urges European legislators to add Iron (Fe), Quartz (SiO₂), Silver (Ag), Tin (Sn), Zinc (Zn), Phosphorus (P4) and Silicon Carbide (SiC) to Annex I and II of the Critical Raw Materials Act**. Ensuring the supply of these critical raw materials is, in addition to the ones already mentioned in Annex I and II, an important building block for a resilient and independent European semiconductor ecosystem.

For further information:

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ABOUT ESIA

The European Semiconductor Industry Association (ESIA) is the voice of the semiconductor industry in Europe. Its mission is to represent and promote the common interests of the Europe-based semiconductor industry towards the European institutions and stakeholders in order to ensure a sustainable business environment and foster its global competitiveness. As a provider of key enabling technologies, the industry creates innovative solutions for industrial development, contributing to economic growth and responding to major societal challenges. Being ranked as the most R&D-intensive sector by the European Commission, the European semiconductor ecosystem supports approx. 200.000 jobs directly and up to 1.000.000 induced jobs in systems, applications and services in Europe. Overall, micro- and nano-electronics enable the generation of at least 10% of GDP in Europe and the world.